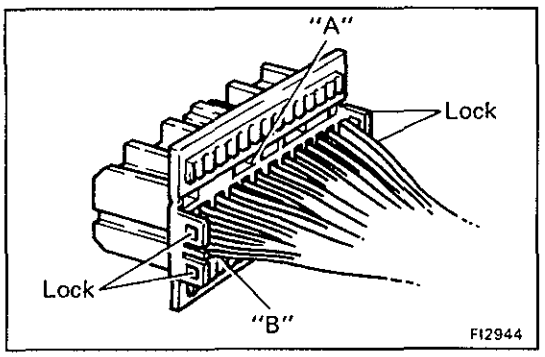
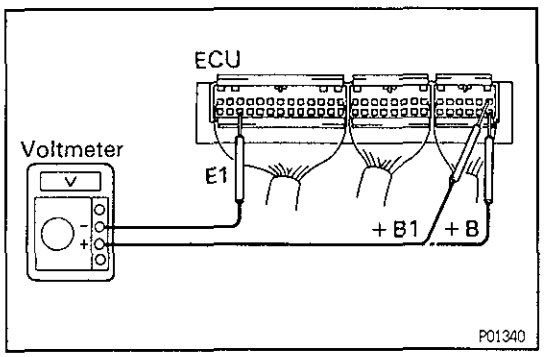
TROUBLESHOOTING W/VOLT,OHMMETER (M/T)

EG27R-01

HINT:

- The following troubleshooting procedures are designed for inspection of each separate system, and therefore the actual procedure may vary somewhat. However, troubleshooting should be performed while referring to the inspection methods described in this manual.
- Before beginning inspection, it is best to first make a simple check of the fuses, H–fuses, fusible links and the condition of the connectors.
- The following troubleshooting procedures are based on the supposition that the trouble lies in either a short or open circuit within the computer.
- If engine trouble occurs even though proper operating voltage is detected in the computer connector, then it can be assumed that the ECU is faulty and should be replaced.





EFI SYSTEM CHECK PROCEDURE

EG27S-01

PREPARATION

(a) Disconnect the connectors from the ECU.

(b) Remove the locks as shown in the illustration so that the tester probe(s) can easily come in.
NOTICE: Pay attention to sections "A" and "B" in the illustration which can be easily broken.

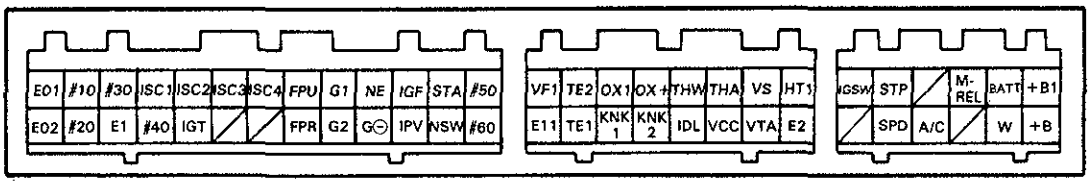
(c) Reconnect the connectors to the ECM.

(d) Using a voltmeter with high impedance (10 kΩ/V minimum), measure the voltage at each terminal of the wiring connectors.
HINT:
- Perform all voltage measurements with the connectors connected.
- Verify that the battery voltage is 11 V or more when the ignition switch is in "ON" position.

EG27T–01

Engine ECU Terminals (M/T)

Symbol	Connection	Symbol	Connection	Symbol	Connection
E01	POWER GROUND	NE	DISTRIBUTOR	THA	INTAKE AIR TEMP. SENSOR
E02	POWER GROUND	G⊖	DISTRIBUTOR	VCC	VACUUM SENSOR THROTTLE POSITION SENSOR
#10	INJECTOR	IGF	IGNITER	VS	AIR FLOW METER
#20	INJECTOR	IPV	VSV FOR EVAP	VTA	THROTTLE POSITION SENSOR
#30	INJECTOR	STA	STARTER RELAY	HT1	OXYGEN SENSOR
E1	ENGINE GROUND	NSW	NEUTRAL START SWITCH	E2	SENSOR GROUND
ISC1	ISC VALVE	#50	INJECTOR	IGSW	IGNITION SWITCH
#40	INJECTOR	#60	INJECTOR		–
ISC2	ISC VALVE	VF1	CHECK CONNECTOR	STP	STOP LIGHT SWITCH
IGT	IGNITER	E11	SENSOR GROUND	SPD	SPEED SENSOR
ISC3	ISC VALVE	TE2	CHECK CONNECTOR		–
	–	TE1	CHECK CONNECTOR	AC	A/C AMPLIFIER
ISC4	ISC VALVE	OX1	OXYGEN SENSOR	M-REL	EFI MAIN RELAY
	–	KNK1	No. 1 KNOCK SENSOR		–
FPU	VSV FOR FUEL PRESSURE CONTROL	OX+	OXYGEN SENSOR	BATT	BATTERY
FPR	FUEL PUMP RELAY	KNK2	No. 2 KNOCK SENSOR	W	WARNING LIGHT
G1	DISTRIBUTOR	THW	WATER TEMP. SENSOR	+B1	EFI MAIN RELAY
G2	DISTRIBUTOR	IDL	THROTTLE POSITION SENSOR	+B	EFI MAIN RELAY



P01821

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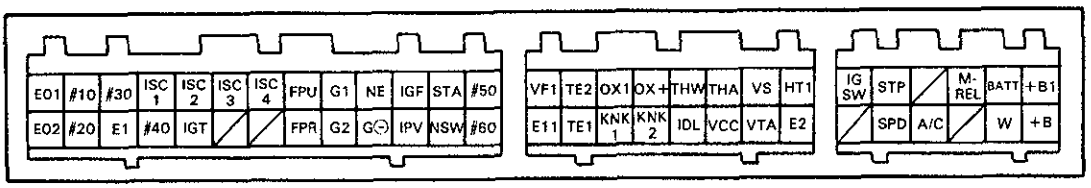
V02835

EG

ECU Wiring Connectors Voltage (M/T)

No.	Terminals	Condition		STD voltage (V)	See page
1	BATT – E1	–		9 – 14	EG-221
	IG SW – E1	IG SW ON			
	M-REL – E1				
	+B, +B1 – E1				
2	IDL – E2	IG SW ON	Throttle valve open	9 – 14	EG-224
	VCC – E2		–	4.5 – 5.5	
	VTA – E2		Throttle valve fully closed (Throttle opener must be cancelled first)	0.3 – 0.8	
			Throttle valve fully open	3.2 – 4.9	
3	VCC – E2		–	4.5 – 5.5	EG-226
	VS – E2		Measuring plate fully closed	3.5 – 4.5	
			Measuring plate fully open	0.2 – 0.5	
		Idling		1.2 – 2.4	
		3,000 rpm		0.8 – 1.3	
4	#10 ⟆ #60 – E01, E02	IG SW ON		9 – 14	EG-227
5	THA – E2	IG SW ON	Intake air temp. 20°C (68°F)	0.5 – 3.4	EG-228
6	THW – E2		Engine coolant temp. 80°C (176°F)	0.2 – 1.0	EG-229
7	STA – E1	Cranking		6 or more	EG-230
8	IGT – E1	Idling		Pulse generation	EG-231
9	ISC1 ⟆ ISC4 – E1	IG SW ON		9 – 14	EG-232
10	W – E1	No trouble (malfunction indicator lamp light off) and engine running		9 – 14	EG-233

ECM Terminals

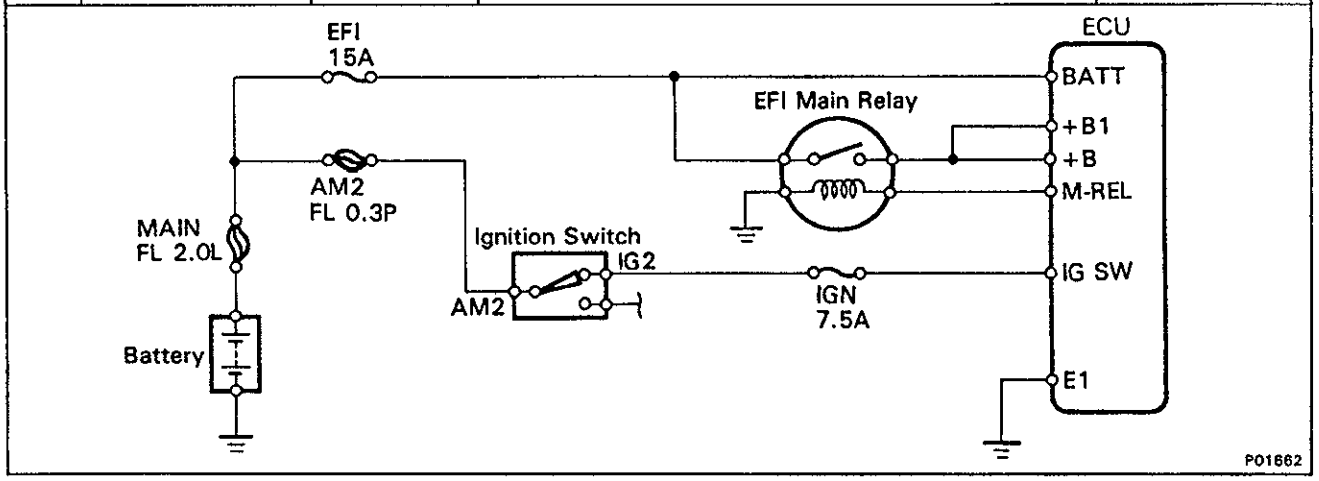


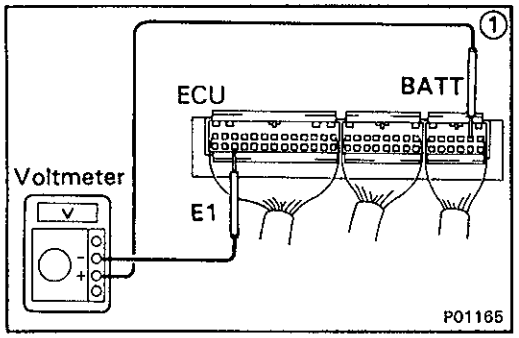
P01821

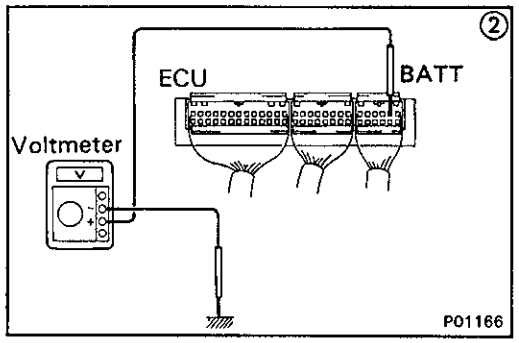
V02836

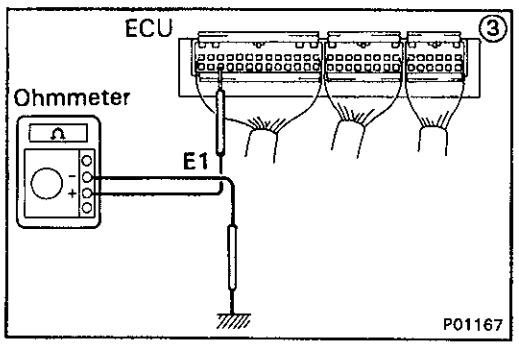
EG27U-01

No.	Terminals	Trouble	Condition	STD voltage
1	BATT – E1	No voltage	–	9 – 14 V
	IG SW – E1	No voltage	IG SW ON	9 – 14 V
	M-REL – E1			
	+B (+B1) – E1			









• **BATT – E1**

① There is no voltage between ECU terminals BATT and E1.

② Check that there is voltage between ECU terminal BATT and body ground.

NO → ③ Check wiring between ECU terminal E1 and body ground.

③ OK → Try another ECU

③ BAD → Repair or replace.

② OK → Check fuse and fusible link.

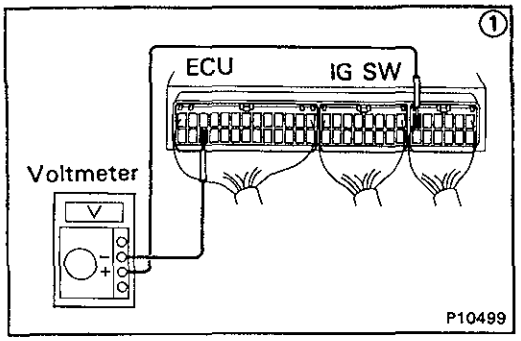
Check fuse and fusible link. BAD → Replace.

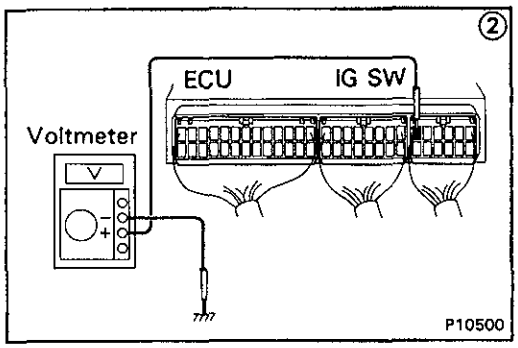
Check fuse and fusible link. OK → Check wiring between ECU terminal and battery.

Check wiring between ECU terminal and battery. BAD → Repair or replace.

V02837

EG





• **IG SW – E1**

① There is no voltage between ECU terminals IG SW and E1. **(IG SW ON)**

② Check that there is voltage between ECU terminal IG SW and body ground. **(IG SW ON)**

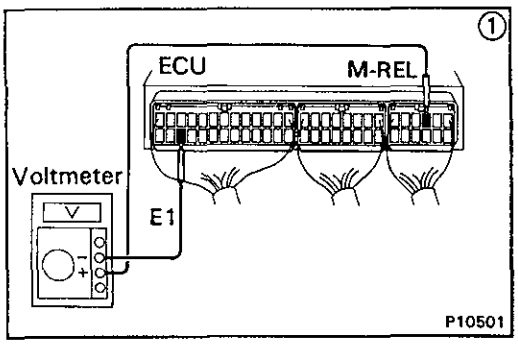
NO

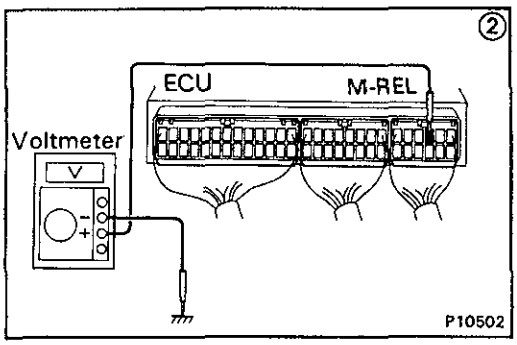
OK → Check wiring between ECU terminal E1 and body ground.

OK → Try another ECU.

BAD → Repair or replace.

Check fuses, fusible link and ignition switch. → BAD → Replair or replace.





• **M-REL – E1**

① There is no voltage between ECU terminals M-REL and E1. **(IG SW ON)**

② Check that there is voltage between ECU terminal M-REL and body ground. **(IG SW ON)**

NO

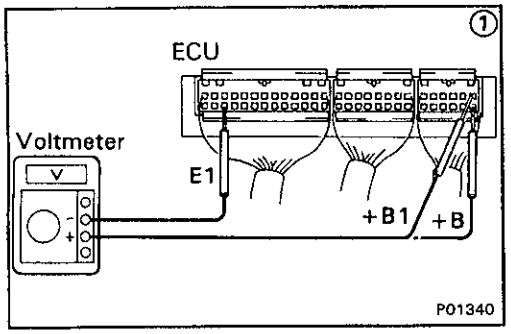
OK → Check wiring between ECU terminal E1 and body ground.

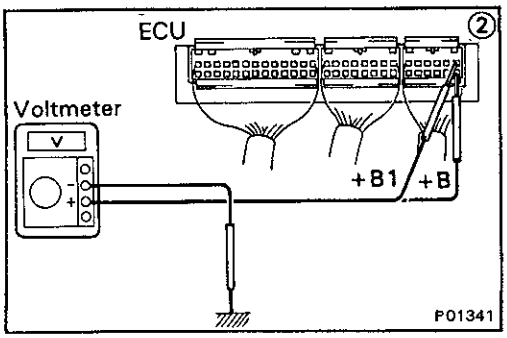
OK → Try another ECU.

BAD → Repair or replace.

Check EFI main relay and wiring harness. (See page EG-272) → BAD → Replace.

OK → Try another ECU.





• **+B (+B1) – E1**

① There is no voltage between ECU terminals +B (+B1) and E1. **(IG SW ON)**

↓

② Check that there is voltage between ECU terminal +B (+B1) and body ground. **(IG SW ON)**

NO → OK

OK → Check wiring between ECU terminal E1 and body ground.

OK → Try another ECU.

BAD → Repair or replace.

Check fuse, fusible link and wiring harness. → BAD → Repair or replace.

OK

Check EFI main relay. (See page EG-272) → BAD → Replace.

OK

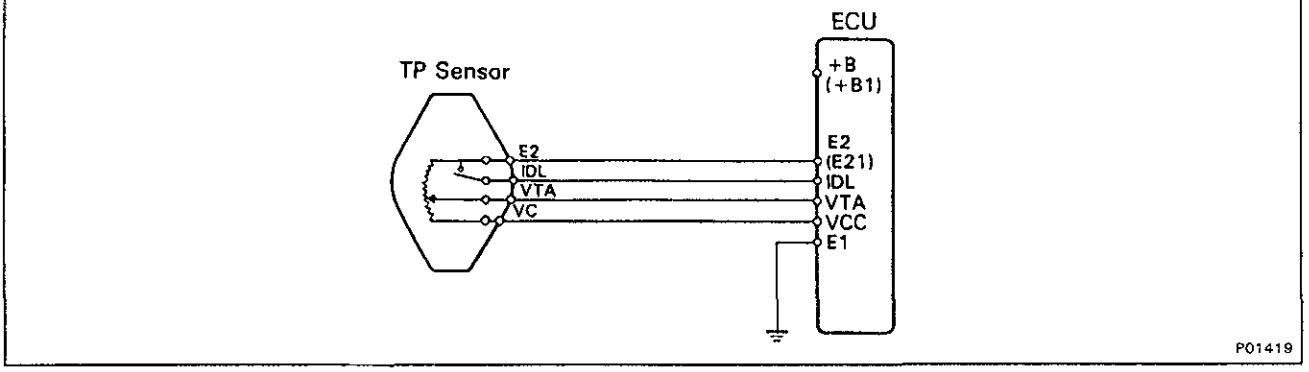
Refer to M-REL – E1 trouble section.

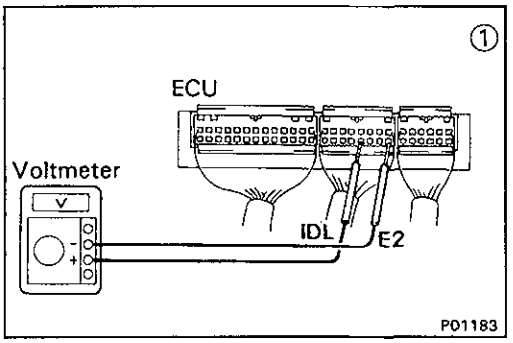
V02839

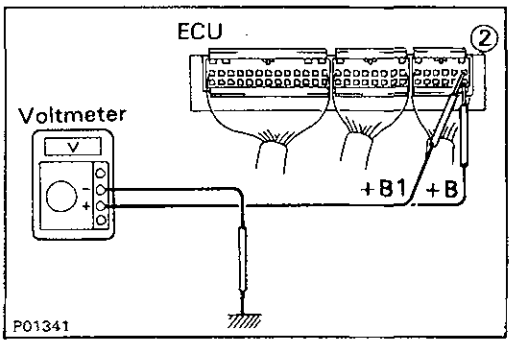
EG

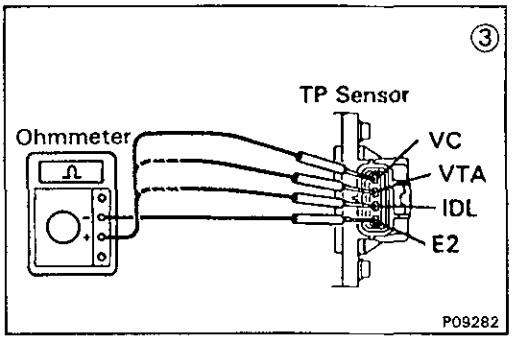
EG

No.	Terminals	Trouble	Condition		STD voltage
2	IDL – E2	No voltage	IG SW ON	Throttle valve open	9 – 14 V
	VCC – E2			–	4.5 – 5.5 V
	VTA – E2			Throttle valve fully closed (Throttle opener must be cancelled first)	0.3 – 0.8 V
				Throttle valve fully open	3.2 – 4.9 V









• **IDL - E2**

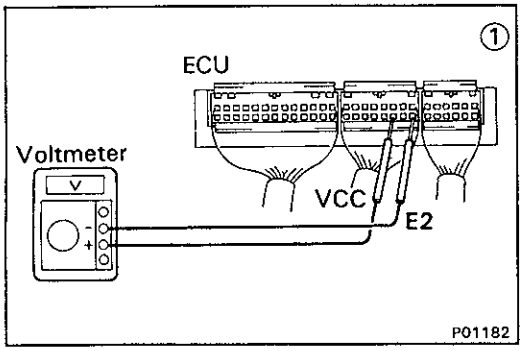
① There is no voltage between ECU terminals IDL and E2. **(IG SW ON)** (Throttle valve open)

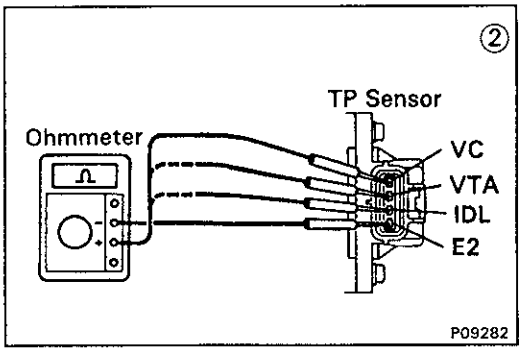
② Check that there is voltage between ECU terminal +B (+B1) and body ground. **(IG SW ON)**

NO → Check wiring between ECU terminal E1 and body ground.
- OK → Try another ECU.
- BAD → Repair or replace.

OK → Refer to No.1. (See page EG-221)
- BAD → Repair or replace.
- OK → ③ Check TP sensor. (See page EG-259)
  - BAD → Repair or replace TP sensor.
  - OK → Check wiring between ECU and TP sensor.
    - BAD → Repair or replace.
    - OK → Try another ECU.

V02840





• **VCC - E2**

① There is no voltage between ECU terminals VCC and E2. **(IG SW ON)**

↓

Check that there is voltage between ECU terminal +B (+B1) and body ground. **(IG SW ON)**

↓ OK → ② Check TP sensor. (See page EG-259)

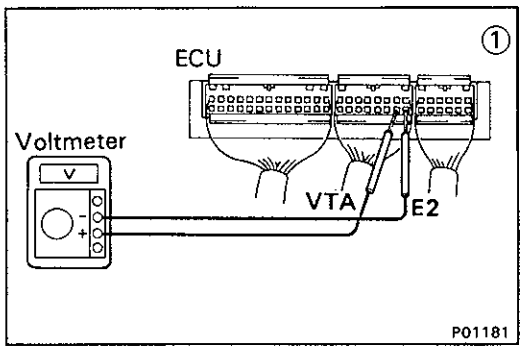
↓ BAD → Repair or replace.

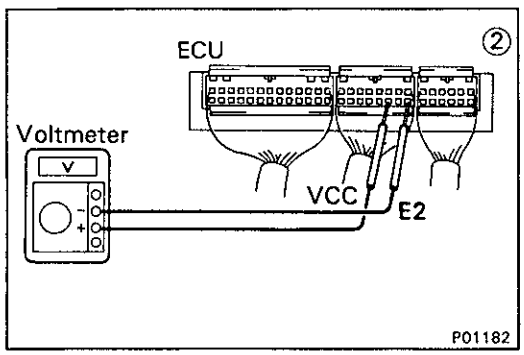
↓ OK → Check wiring between ECU and TP sensor.

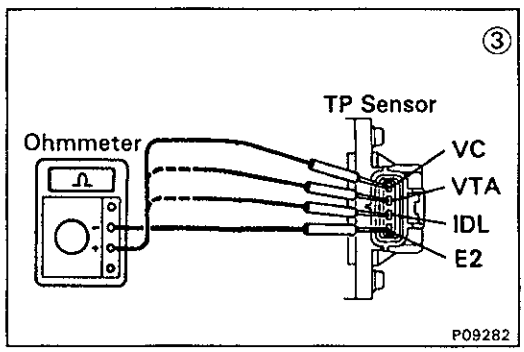
↓ OK → Try another ECU.

↓ BAD → Repair or replace wiring.

↓ NO → Refer to No.1. (See page EG-221)







• **VTA - E2**

① There is no specified voltage at ECU terminals VTA and E2. **(IG SW ON)**

↓

② Check that there is voltage between ECU terminals VCC and E2. **(IG SW ON)**

↓ NO → Refer to VCC — E2 trouble section.

↓ OK

OK →

↓

③ Check TP sensor. (See page EG-259)

↓ BAD → Repair or replace.

↓ OK

Check wiring between ECU and TP sensor.

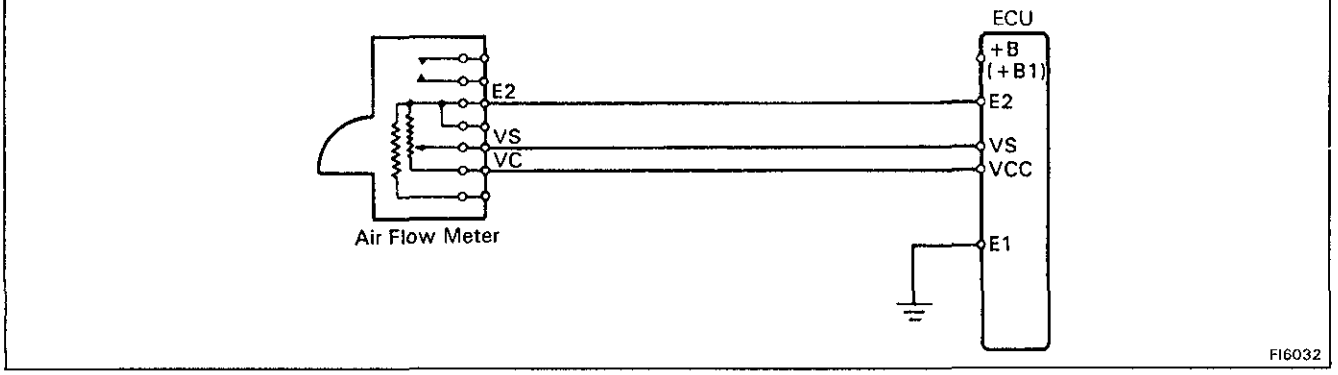
↓ BAD → Repair or replace.

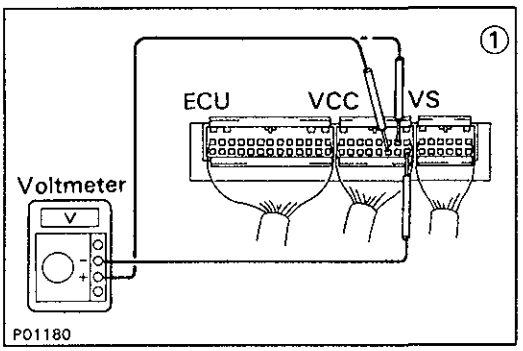
↓ OK → Try another ECU.

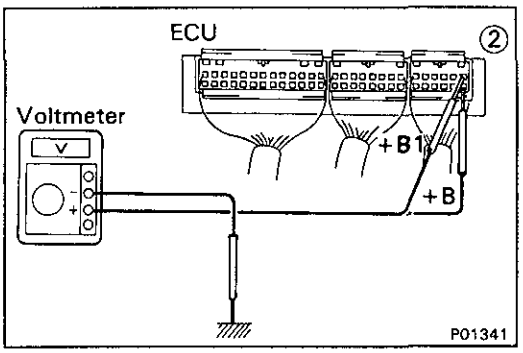
EG

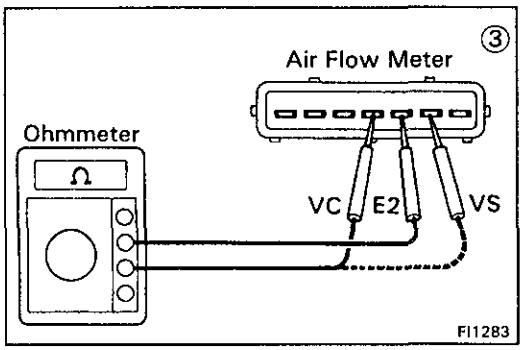
EG

No.	Terminals	Trouble	Condition		STD voltage
3	VCC – E2	No voltage	IG SW ON	–	4.5 – 5.5 V
	VS – E2			Measuring plate fully closed	3.5 – 4.5 V
	VS – E2			Measuring plate fully open	0.2 – 0.5 V
	VS – E2		Idling		1.2 – 2.4 V
	VS – E2		3,000 rpm		0.8 – 1.3 V









① There is no voltage between ECU terminals VCC or VS and E2. **(IG SW ON)**

② Check that there is voltage between ECU terminal +B (+B1) and body ground. **(IG SW ON)**

OK → Check wiring between ECU terminal E1 and body ground.

NO → Refer to No. 1 (See page EG-221)

OK → ③ Check air flow meter. (See page EG-267)

BAD → Repair or replace.

BAD → Replace air flow meter.

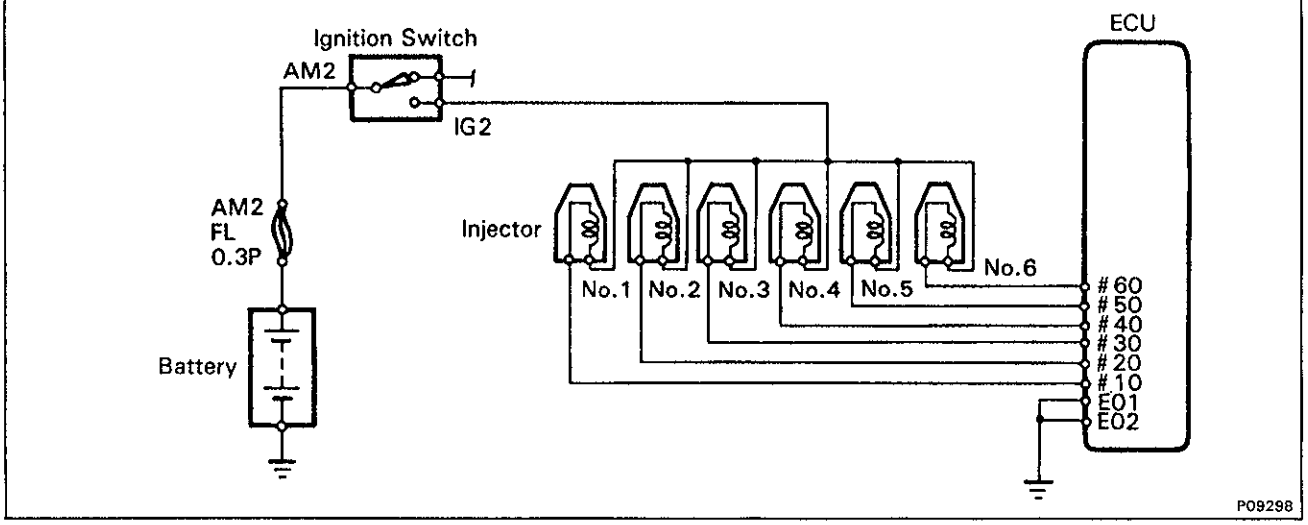
OK → Check wiring between ECU and air flow meter.

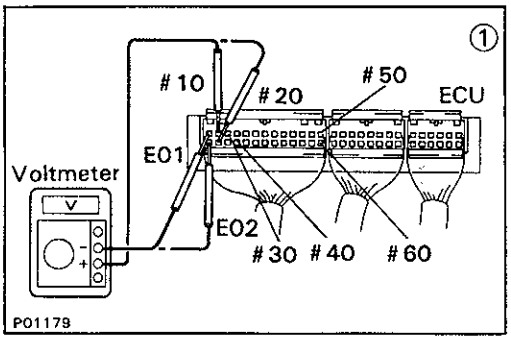
OK → Try another ECU.

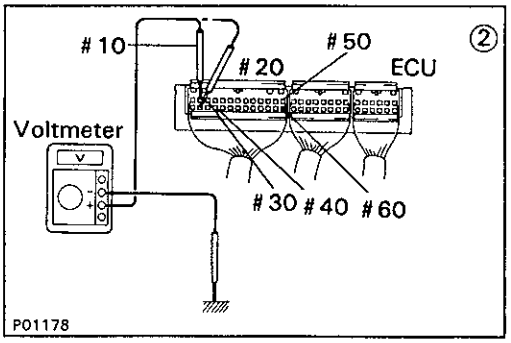
BAD → Repair or replace.

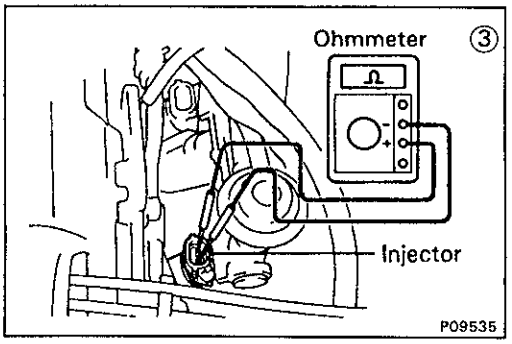
V02842

No.	Terminals	Trouble	Condition	STD voltage
4	#10 E01 ≀ – #60 E02	No voltage	IG SW ON	9 – 14 V









① There is no voltage between ECU terminals #10 ~ #60 and E01 and/or E02. **(IG SW ON)**

② Check that there is voltage between ECU terminal #10 ~ #60 and body ground.

NO → OK

Check wiring between ECU terminal E01 and/or E02 and body ground.

OK → Try another ECU.

BAD → Repair or replace.

Check fusible link and ignition switch.

BAD → Repair or replace.

OK

③ Check resistance of each injector.
STD resistance: Approx. 13.8 Ω

OK

BAD → Replace injector.

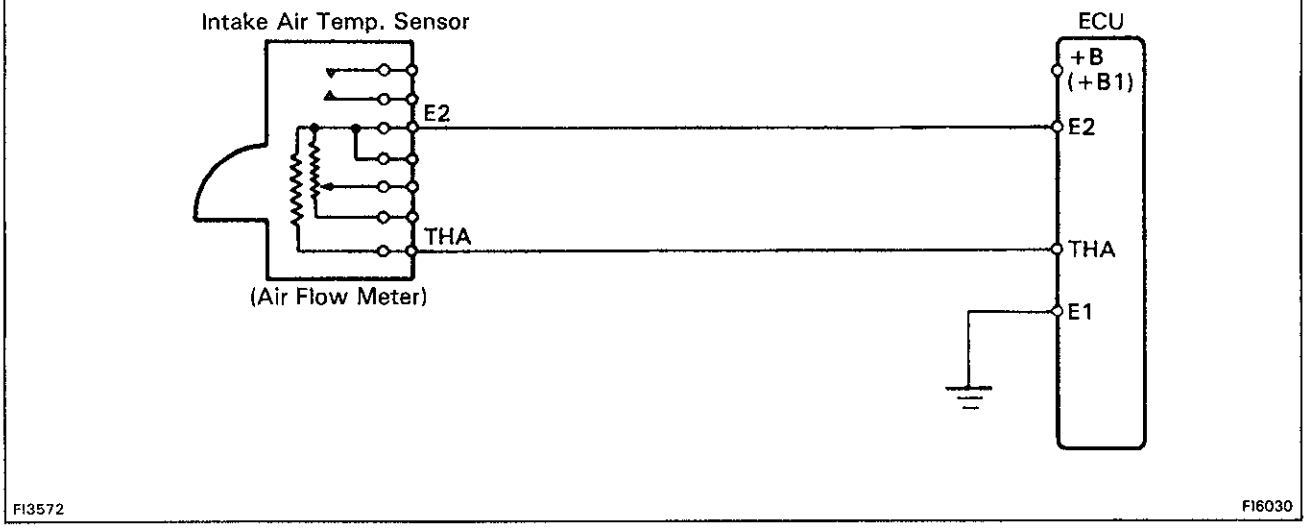
Check wiring between ECU terminal #10 ~ #60 and battery.

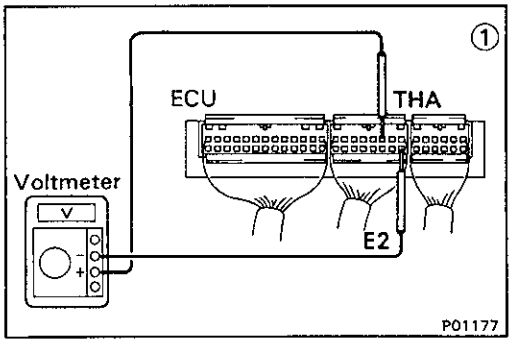
BAD → Repair or replace.

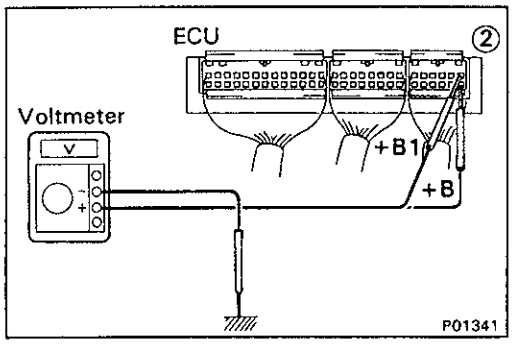
V02843

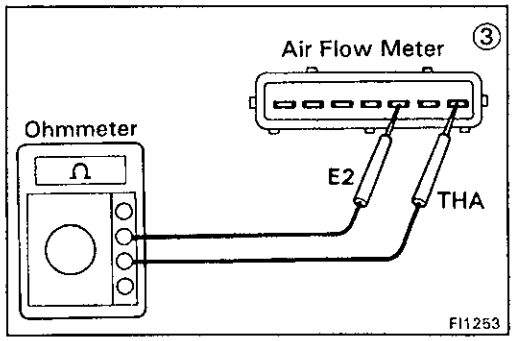
EG

No.	Terminals	Trouble	Condition		STD voltage
5	THA – E2	No voltage	IG SW ON	Intake air temperature 20 °C (68 °F)	0.5 – 3.4 V









① There is no voltage between ECU terminals THA and E2. **(IG SW ON)**

↓

2 Check that there is voltage between ECU terminal +B (+B1) and body ground. **(IG SW ON)**

OK → ↓

NO → Refer to No.1 (See page EG-221)

↓

Check wiring between ECU terminal E1 and body ground.

OK → ↓

BAD → Repair or replace.

↓

③ Check Intake air temp. sensor. (See page EG-268)

BAD → Replace air flow meter.

OK → ↓

Check wiring between ECU and Intake air temp. sensor.

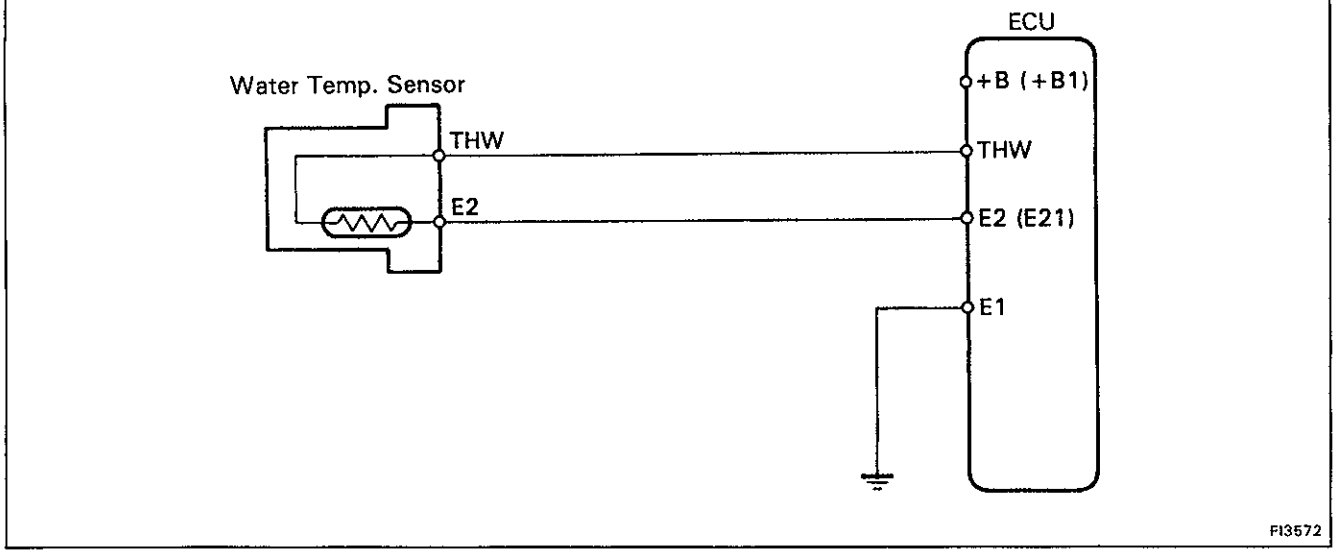
OK → ↓

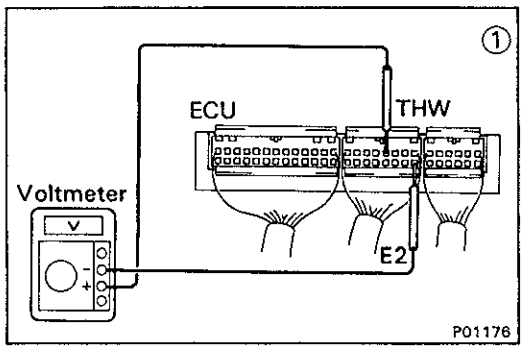
BAD → Repair or replace.

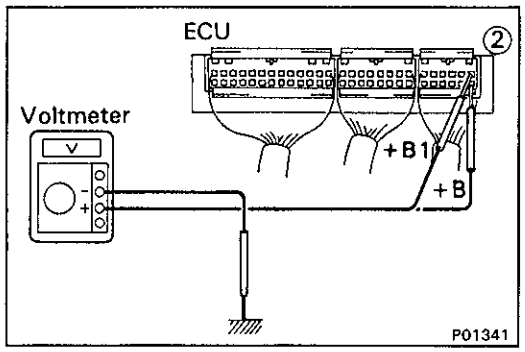
↓

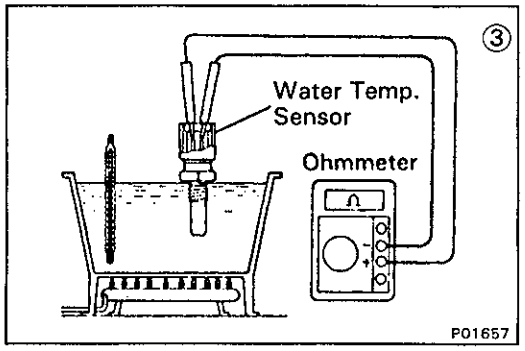
Try another ECU.

No.	Terminals	Trouble	Condition		STD voltage
6	THW – E2	No voltage	IG SW ON	Engine coolant temperature 80 °C (176 °F)	0.2 – 1.0 V









① There is no voltage between ECU terminals THW and E2. **(IG SW ON)**

↓

② Check that there is voltage between ECU terminal +B (+B1) and body ground. **(IG SW ON)**

OK ↓ / NO → Refer to No.1 (See page EG-221)

↓

Check wiring between ECU terminal E1 and body ground.

OK ↓ / BAD → Repair or replace.

↓

③ Check water temp. sensor. (See page EG-275)

BAD ↓ / OK →

Replace water temp. sensor.

Check wiring between ECU and ECT sensor.

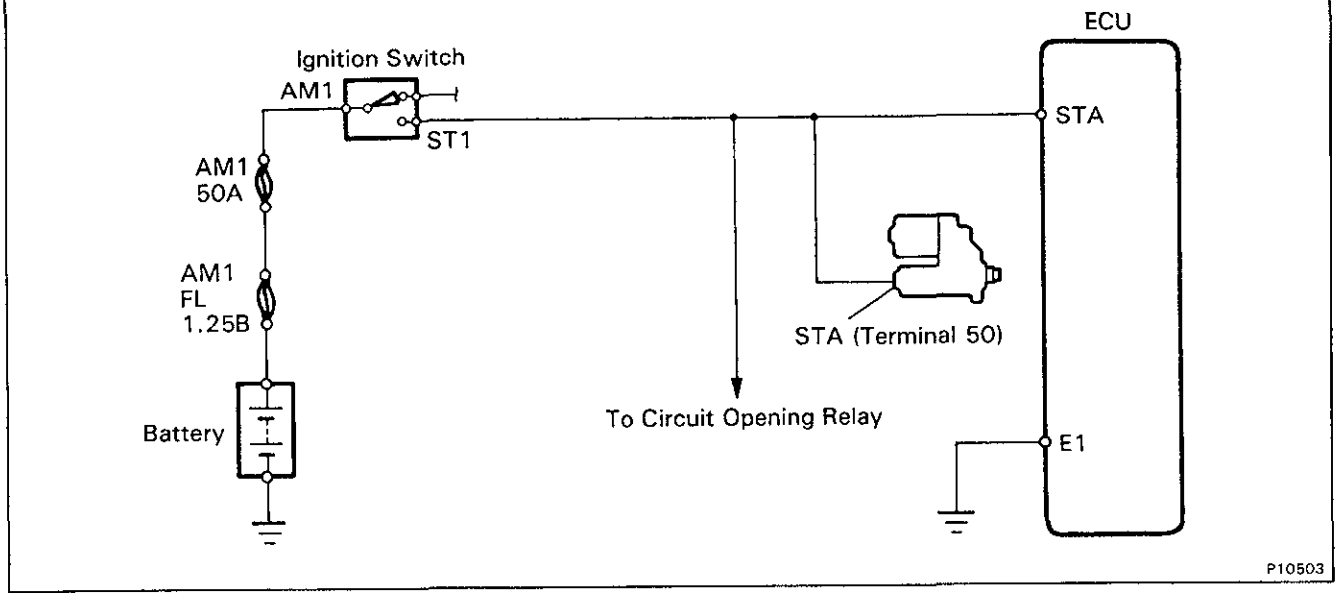
OK ↓ / BAD → Repair or replace.

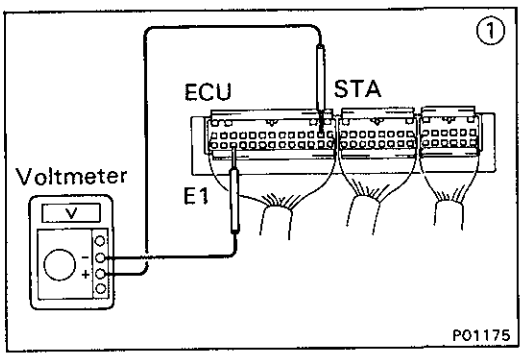
Try another ECU.

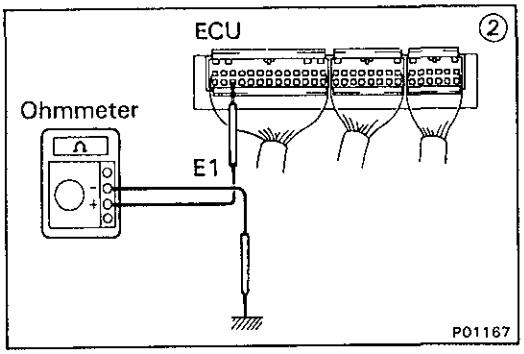
V02845

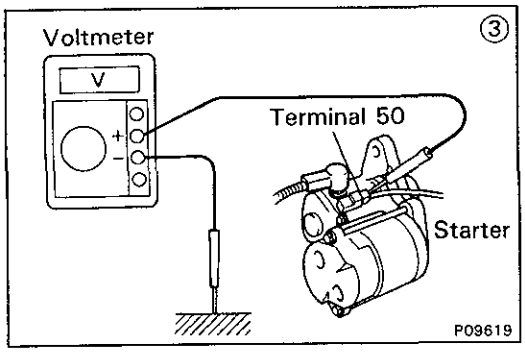
EG

No.	Terminals	Trouble	Condition	STD voltage
7	STA – E1	No voltage	Cranking	6 V or more









① There is no voltage between ECU terminals STA and E1. **(IG SW START)**

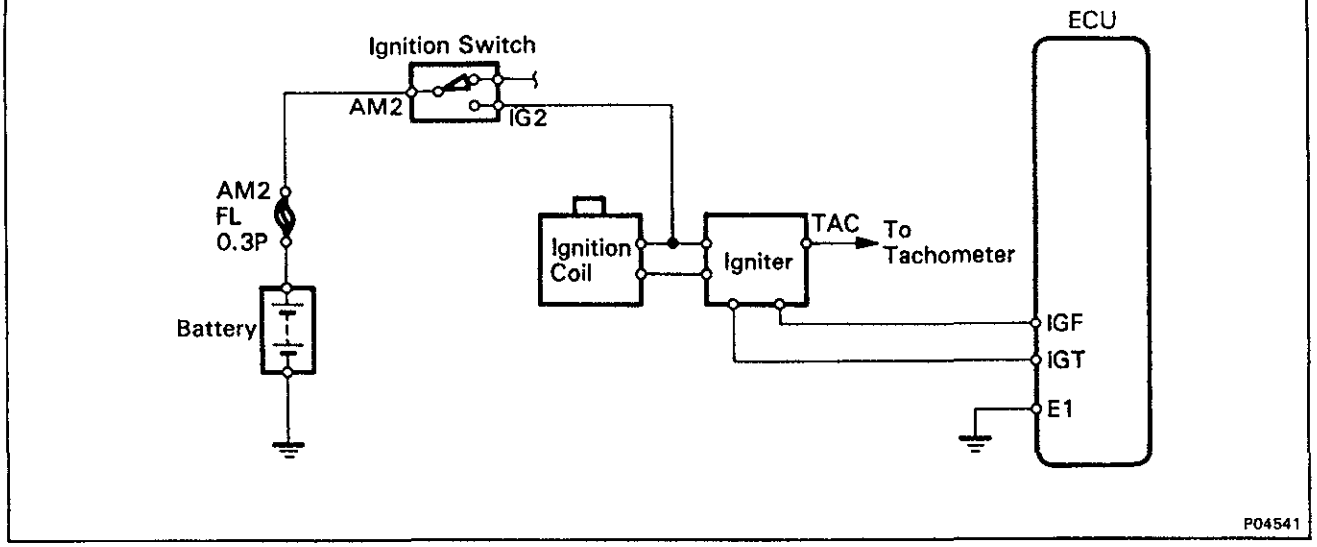
Check starter operation.
- OK → Check wiring between ECU terminal STA and ignition switch terminal ST1.
  - OK → ② Check wiring between ECU terminal E1 and body ground.
    - OK → Try another ECU.
    - BAD → Repair or replace.
  - BAD → Repair or replace.
- BAD

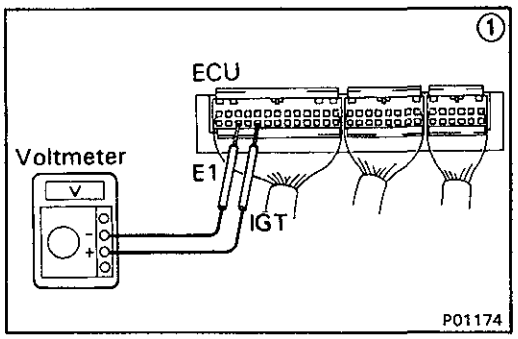
Check H-fuse, fusible link, battery, wiring, ignition switch and neutral start switch.
- BAD → Repair or replace.
- OK

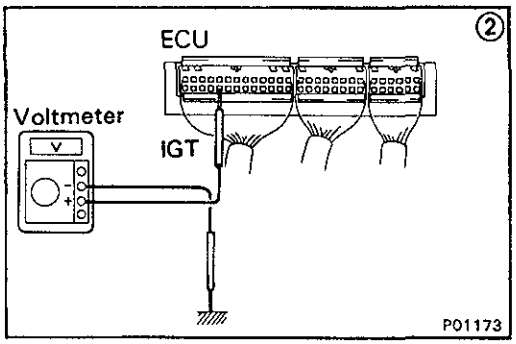
③ Check that there is voltage at starter terminal 50. **(IG SW START) STD voltage: 6 V or more**
- OK → Check starter.
- NO → Check wiring between ignition switch terminal ST1 and starter terminal 50.

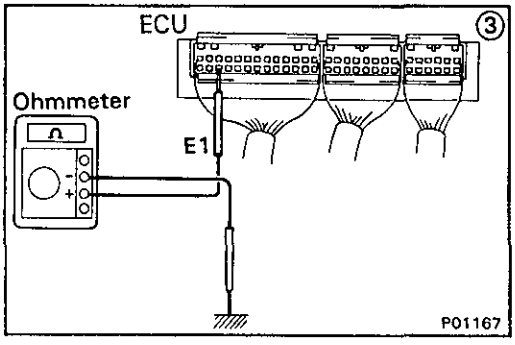
V02846

No.	Terminals	Trouble	Condition	STD voltage
8	IGT — E1	No voltage	Idling	Pulse generation









① There is no voltage between ECU terminals IGT and E1. **(Idling)**

② Check that there is voltage between ECU terminal IGT and body ground **(Idling)**

NO

OK

③ Check wiring between ECU terminal E1 and body ground. — BAD → Repair or replace.

OK

Try another ECU.

Check fusible link and ignition switch. — BAD → Repair or replace.

OK

Check distributor (See IG section) — BAD → Repair or replace.

OK

Check wiring between ECU and battery. — BAD → Repair or replace.

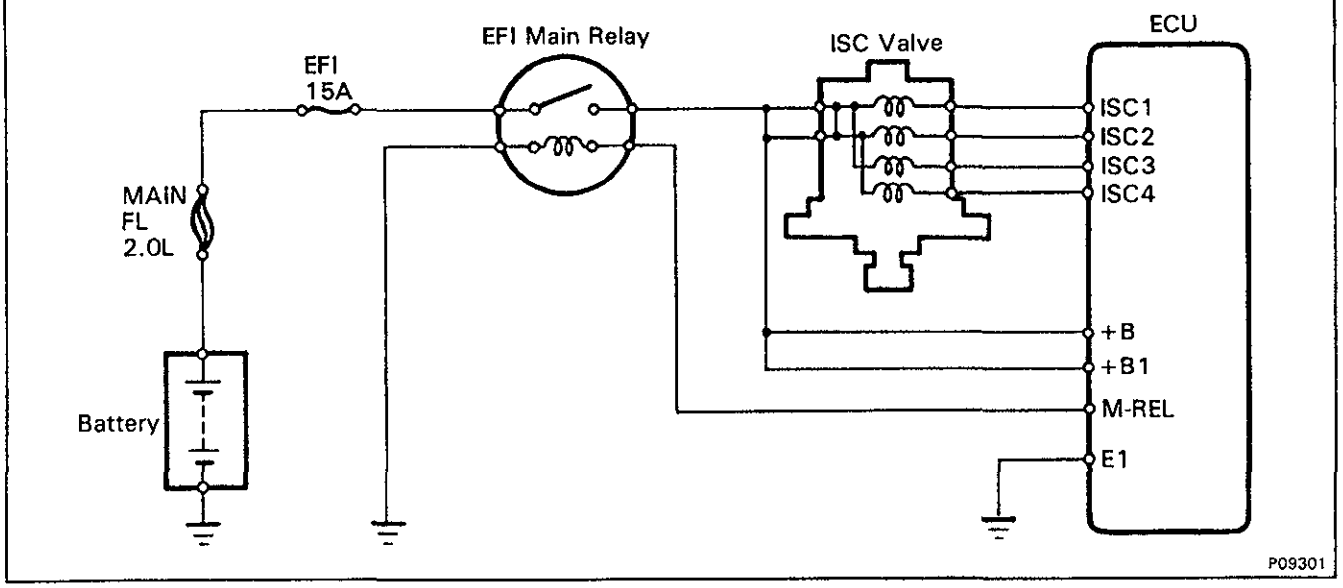
OK

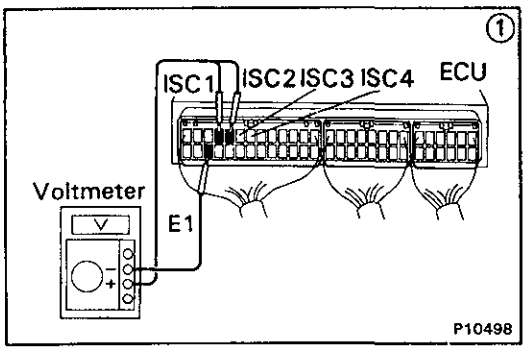
Check igniter. (See IG section) — BAD → Repair or replace.

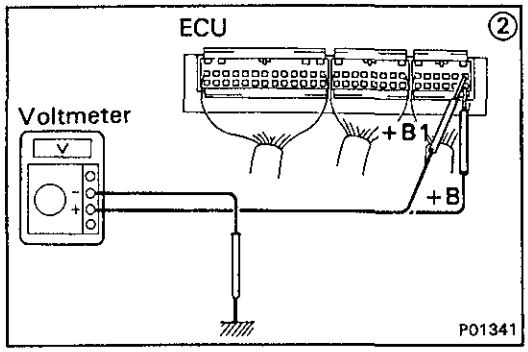
V02847

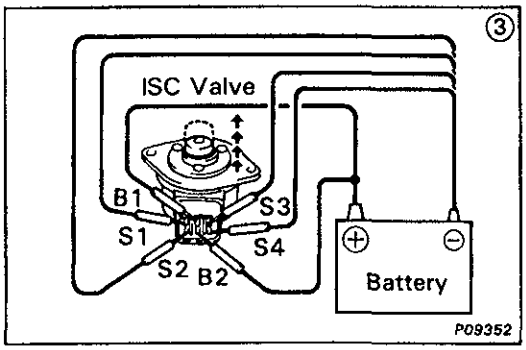
EG

No.	Terminals	Trouble	Condition	STD voltage
9	ISC1~ISC4—E1	No voltage	IG SW ON	9 – 14 V









① There is no voltage between ECU terminals ISC1 ~ ISC4 and E1. **(IG SW ON)**

② Check that there is voltage between ECU terminal +B (+B1) and body ground. **(IG SW ON)**

OK → Check wiring between ECU terminal E1 and body ground.

NO → Refer to No.1. (See page EG-221)

OK → ③ Check ISC valve. (See page EG-269)

BAD → Repair or replace.

BAD → Replace ISC valve.

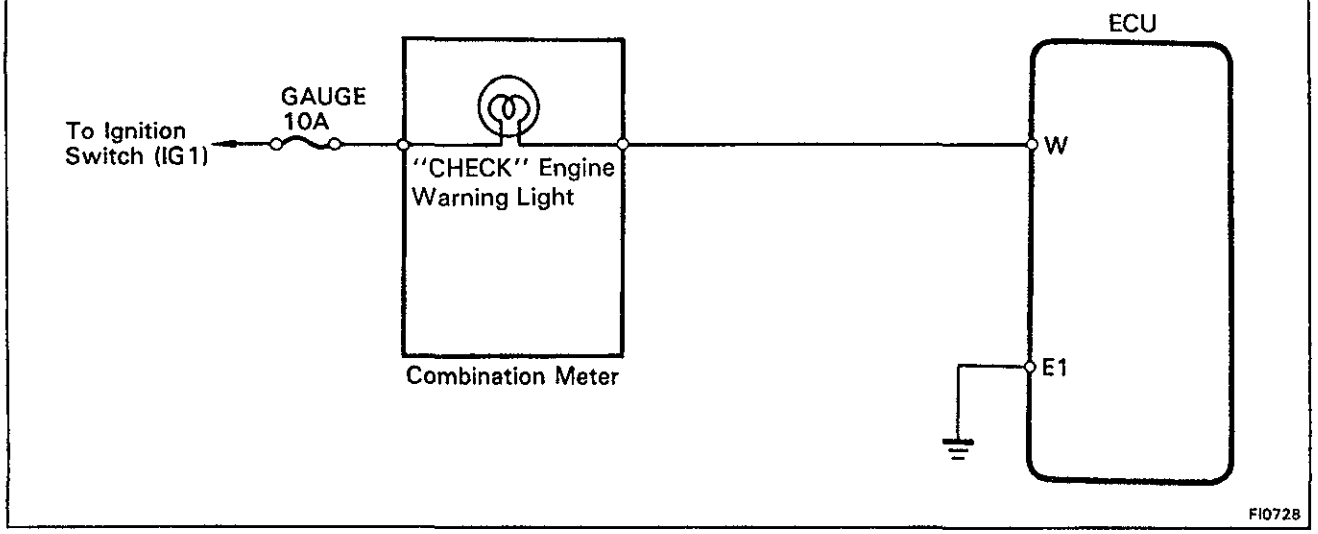
OK → Check wiring between ECU and EFI main relay.

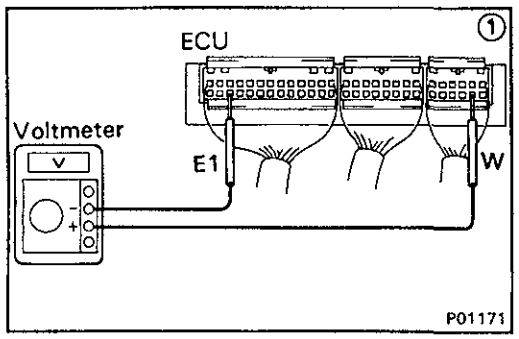
OK → Try another ECU.

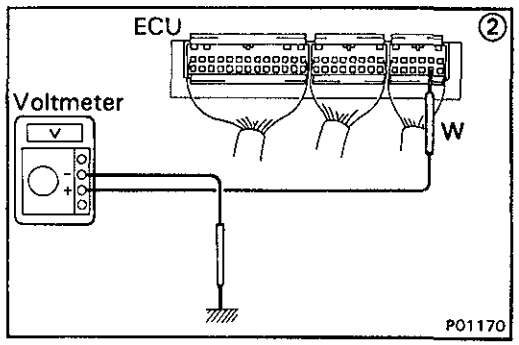
BAD → Repair or replace.

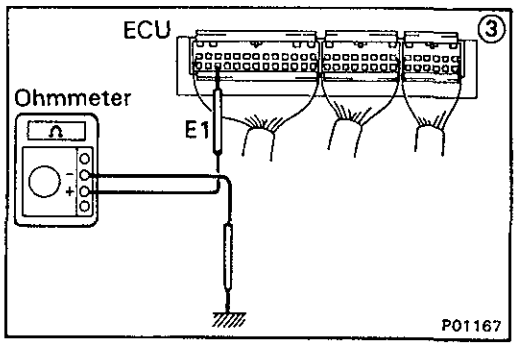
V02848

No.	Terminals	Trouble	Condition	STD voltage
10	W – E1	No voltage	No trouble (malfunction indicator lamp light off) and engine running.	9 – 14 V









① There is no voltage between ECU terminals W and E1. **(Idling)**

② Check that there is voltage between ECU terminal W and body ground.

NO

OK

③ Check wiring between ECU terminal E1 and body ground.

OK

Try another ECU.

BAD

Repair or replace.

Check GAUGE fuse (10A) and malfunction indicator lamp.

OK

BAD

Repair or replace.

Fuse blows again

Check wiring between ECU terminal W and fuse.

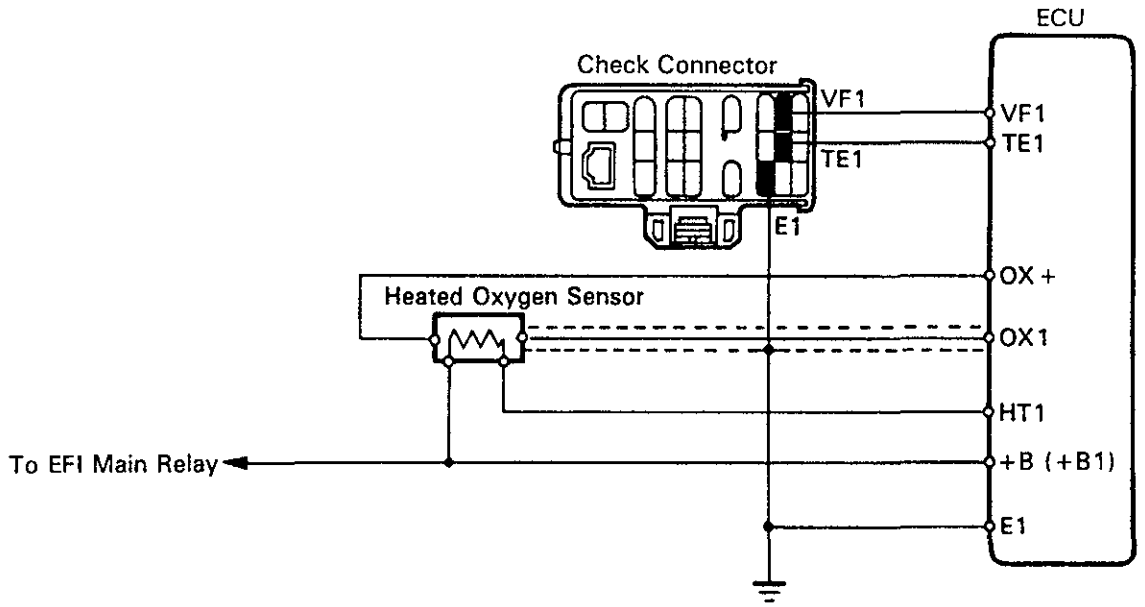
BAD

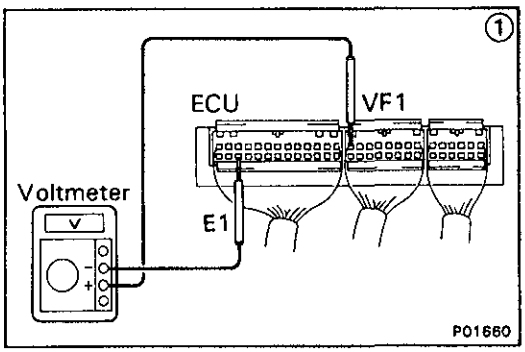
Repair or replace.

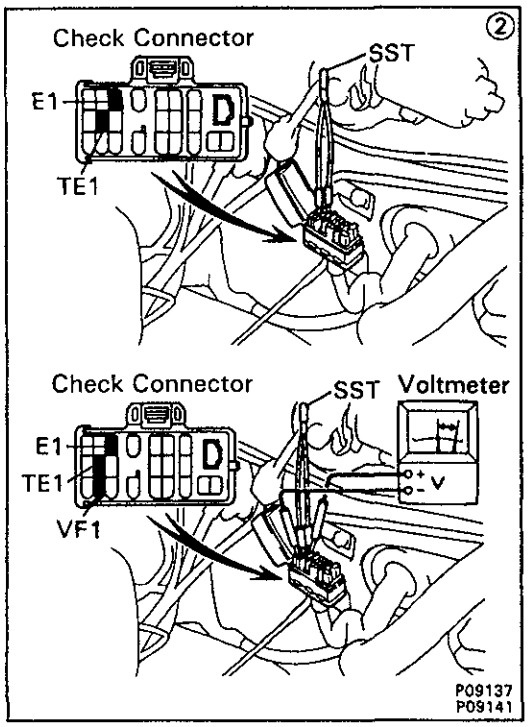
V02849

EG

Oxygen Sensor







① There is no voltage between ECU terminals VF1 and E1.

Check that there is specified voltage between ECU terminal VF1 and body ground.

NO → OK → Check wiring between ECU terminal E1 and body ground.

OK → Try another ECU.

BAD → Repair or replace.

Check for air suction of air into exhaust system. BAD → Repair air suction.

OK

Check for air leak from air induction system. BAD → Repair air leak.

OK

Check spark plugs. BAD → Repair or replace.

OK

Check distributor and ignition system. BAD → Repair or replace.

OK

Check fuel pressure. BAD → Repair or replace.

OK

Check injectors. BAD → Repair or replace.

OK

Check air flow meter. BAD → Repair or replace.

OK

② Check operation of oxygen sensor. OK → System normal.

BAD

Check wiring between oxygen sensor and ECU connectors. BAD → Repair wiring.

OK

Repair oxygen sensor.

V02850